Magnetic and transport properties of LaMnO3/La0.67Ba0.33MnO3 single and bi-layer thin films

ABSTRACT

Single and bi-layer thin films of LaMnO3 and La0.67Ba0.33MnO3 were deposited on amorphous fused silica substrate via pulsed laser deposition technique (PLD). In this work, the effect of stacking sequence in bi-layer manganite films of LaMnO3 and La0.67Ba0.33MnO3 was reported. The crystal structure formation, magnetic, resistivity and magnetotransport properties of bi-layer manganite films were studied. The unit cell of LMO undergo negative misfit when growth on LBMO while positive misfit for unit cell of LBMO when growth on LMO. Such changes indirectly alter the magnetism of the system since it governed by the Mn-O-Mn bond angle and Mn-O bond length. Therefore, different magnetic pinning strength was observed between the LMO and LBMO layer coupled in LMO/LBMO and LBMO/LMO respectively. The stronger the magnetic spins pinning effect, the higher the resistivity is and the more scattered the %MR are.

Keyword: Colossal magnetoresistance; Thin film; Manganite; Crystal structure; Magnetism